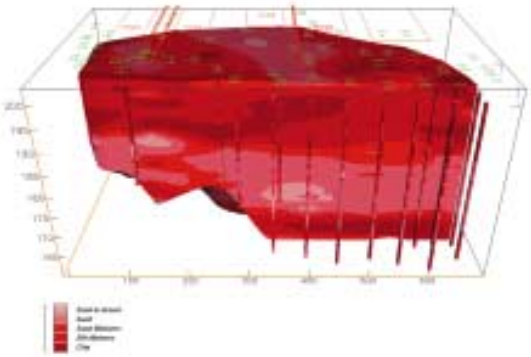
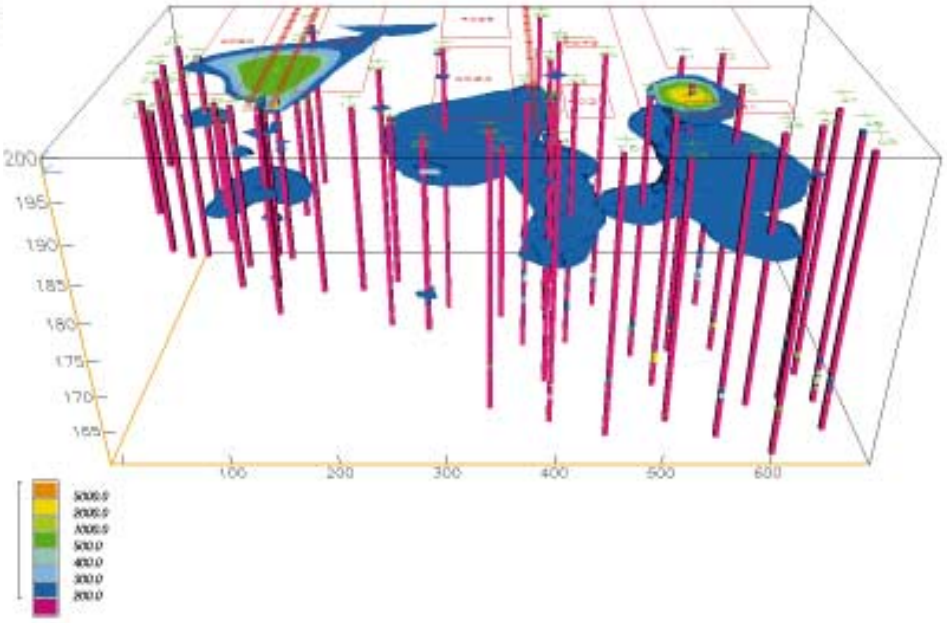
Tri-Service SCAPS Laser Induced Fluorescence Sensor

Detection, Identification, and Delineation of POL - Contaminated Sites





Tri-Service SCAPS Laser Induced Fluorescence (LIF) Sensor offers fast, detailed characterization of petroleum, oil, and lubricants (POL) contamination at relatively low cost.

Traditional methods of site characterization are costly and time consuming. Using the Laser Induced Fluorescense (LIF) Sensor, deployed by the Tri-Service Site Characterization and Analysis Penetrometer System (SCAPS), results in reduced cost and time in the characterization and evaluation of POL contaminated sites. SCAPS and its associated sensors provide the DoD, DOE, EPA, and the private sector with a cost-effective means to rapidly characterize subsurface conditions at contaminated sites through real time, on-site data acquisition and processing.

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Characterization of POL Contamination

The Tri-Service SCAPS Laser Induced Fluorescence (LIF) Sensor can delineate the extent of subsurface POL contamination, as well as map subsurface stratigraphy, more accurately and less expensively than widely spaced monitoring wells and soil borings. In addition to the initial site characterization, a substantial reduction in time and cost in subsequent monitoring and remediation efforts can be realized using the information obtained from the SCAPS LIF Sensor System.

The LIF Sensor uses an ultraviolet (UV) laser to induce fluorescence in subsurface POL contamination. Using a fiber optic cable, the UV-laser energy is transmitted from the surface down an umbilical, through a sapphire window located on the side of the probe, and is emitted into the surrounding soil. The POL contaminants become excited and emit fluorescent energy that is carried by another fiber optic cable back to the SCAPS truck where it is analyzed in real time. This process is continuous, gathering data as the probe is steadily pushed through the subsurface media.

While the LIF Sensor gathers contaminant data, continuous subsurface layering or stratigraphy data is also obtained during a push. In order to ensure there is no conduit for contamination to move from one area to another, grout is used to seal the penetration hole during probe retraction. A mixture of cement, bentonite, and water is pumped through an internal tube in the probe to the tip. The grout forces the ejection of the probe tip and fills the hole as the LIF Sensor probe is retracted.

The SCAPS LIF Sensor has obtained numerous evaluations and certifications through Federal and state regulatory agencies, including the U.S. Environmental Protection Agency (USEPA) Superfund Innovative Technology Evaluation (SITE) Program, the USEPA Consortium for Site Characterization Technology (CSCT), the California EPA Innovative Environmental Technology Certification Program, and the Interstate Technology Regulatory Cooperation (ITRC) Workgroup. A cost/benefit analysis conducted by DOE *(DOE Report #LAUR-91-4016)* indicates that at least 25 to 35 percent cost avoidance can be realized with the SCAPS LIF technology. The patented Tri-Service SCAPS LIF Sensor is licensed, commercially available, and in use worldwide.

Application of innovative SCAPS field screening technologies, such as the Laser Induced Fluorescence (LIF) Sensor, results in faster, more detailed site characterizations at significantly reduced costs compared to traditional methods.

Solutions

For more information on USAEC-ETD technology programs please call the:

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